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Final

Site 5 Hot Spot Removal Areas Delineation Report

St. Juliens Creek Annex
Chesapeake, Virginia

NAVFAC
Naval Facilities Engineering Command
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Prepared by

CH2MHILL

Site 5 Hot Spot Removal Areas Delineation Report, St. Juliens Creek Annex, Chesapeake, Virginia

PREPARED FOR: SJCA Tier I Partnering Team

PREPARED BY: CH2M HILL

DATE: December 6, 2007

1 Introduction

This memorandum summarizes delineation activities and presents the recommendations for the three isolated surface soil hot spots at Site 5 recommended for removal in the *Final Engineering Evaluation/Cost Analysis (EE/CA) for Site 5 Waste/Burnt Soil Area and Impacted Surface Soil and Sediment Areas* (CH2M HILL, 2007). The hot spots were selected for removal as follows:

- **SJS05-SS19:** human health risk-based removal area for lead
- **SJS05-SS35:** ecological risk-based removal area for 4,4'-dichlorodiphenyldichloroethane (4,4'-DDE) and 4,4'-dichlorodiphenyltrichloroethane (4,4'-DDT)
- **SJS05-SS66:** human health risk-based removal area for copper and lead

This memorandum was prepared under the United States Navy, Naval Facilities Engineering Command (NAVFAC) Mid-Atlantic, Comprehensive Long-term Environmental Action Navy (CLEAN) III, Contract N62470-02-D-3052, Contract Task Order (CTO) 0139.

2 Site Description and Background

Site 5 is the former Burning Grounds, consisting of approximately 23 acres located in the northeastern portion of St. Juliens Creek Annex (SJCA). The site currently consists of an open field with a wetland in the central portion and a forested area in the southern portion (Figure 1). A significant portion of the site's southwestern area is covered with a layer of gravel. The Site 5 topography is generally level and slopes gently toward Blows Creek. Groundwater flow follows the topography and flows toward Blows Creek. Vegetated drainage ditches, 1- to 3-feet deep, are reducing runoff onto the site from adjacent areas. Site 6, located within the east-central portion of Site 5, is a former Installation Restoration (IR) site that was closed under a no action Record of Decision (ROD) in September 2003 after a removal action.

Several investigations, including the Remedial Investigation (RI) (CH2M HILL, 2003a) and the Expanded RI (CH2M HILL, 2006), have been conducted in order to characterize the nature and extent of contamination at the site. The RI and Expanded RI human health and

ecological risk assessments concluded that there is potential risk to human and ecological receptors from exposure to chemicals in soil (primarily metals and pesticides). Based on the RI and Expanded RI results, an EE/CA was conducted and included identification of removal action alternatives to mitigate the potential risks identified. The recommended alternative included excavation, disposal characterization, disposal of impacted surface soil and sediment, and site restoration. The determination of the limits of the excavations is dependent on whether they are driven by human health or ecological risk. The majority of the removal areas were defined in the EE/CA based on existing sample locations that did not present an unacceptable risk. However, although the results of the sample collected from SJS05-SS19, SJS05-SS35, and SJS05-SS66 indicated those locations posed an unacceptable level of risk and required removal, no existing sample data was available in their vicinities to define their extent. A 50-ft radius removal area around the samples was assumed during the EE/CA, but delineation was required.

3 Field Investigation Activities and Results

This section provides a description of the field activities and presents the results of the initial and follow-up field mobilizations conducted in June and August 2007 to delineate the hot spots. The *Final Master Project Plan (MPP), St. Juliens Creek Annex, Chesapeake, Virginia* (CH2M HILL, 2003b) addresses the protocols and standard operating procedures (SOPs) used for all investigations at SJCA. The field activities described below were conducted in accordance with the *Final Work Plan for Delineation of Hot Spot Removal Areas at Site 5, St. Juliens Creek Annex* (CH2M HILL, 2007).

Prior to initiating intrusive activities, all sampling locations were cleared for utilities by a third-party subcontractor. Sample locations were selected following the procedures required by the Explosives Safety Submissions (ESS) Determination Response (NOSSA, 2007), which comprised anomaly avoidance. No munitions and explosives of concern (MEC) were encountered during the field activities.

3.1 Soil Sampling

Because no risk was identified to human or ecological receptors from exposure to subsurface soil, the hot spot delineation was limited to surface soil (CH2M HILL, 2003a). Therefore, all the soil samples were collected from 0 to 1 ft below ground surface (bgs), with 0 indicating the level of exposed soil.

In vegetated areas, all organic material (roots and grasses) or gravel were removed from the samples prior to placement into sample containers. The samples were collected with a decontaminated hand auger, placed in a decontaminated stainless steel bowl, homogenized, and contained in laboratory-prepared, sample bottles and packed on ice for overnight shipment to a pre-approved offsite laboratory.

Appropriate quality assurance/quality control (QA/QC) sampling was performed in accordance with Navy CLEAN and CH2M HILL protocols, including field blanks, equipment blanks, duplicates, and matrix spike/matrix spike duplicates (MS/MSDs). The QA/QC data collected are provided in Attachment A.

Analytical data reports, in hardcopy and electronic format were submitted to a Navy-approved third-party data validator. Procedures outlined in the *Region III Modifications to Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Analysis* (USEPA, 1993) and the *Region III Modifications to National Functional Guidelines for Organic Data Review Multi-media, Multi-concentration* (USEPA, 2004) were used for validation. The complete analytical results are provided in Attachment A. The data validation summary report is provided in Attachment B.

SJS05-SS19 Hot Spot

A global positioning system (GPS) unit was used to identify the location of sample SJS05-SS19, which was collected during RI activities in 1997. To confirm the presence of the hot spot, a surface soil sample was collected from the identified location. Four wall samples were collected around the location of SJS05-SS19 radially in each direction at 10-ft intervals to a total distance of 50 ft from the initial sample location in order to horizontally delineate the hot spot extent for removal. Samples were targeted in depositional and/or low topographic areas, when present.

Although lead was detected at a lower concentration than it was in the SJS05-SS19 sample collected during the RI [4,000 milligrams per kilograms (mg/kg)], the level was still elevated (1,190 mg/kg) above the risk-based cleanup goal (400 mg/kg average) (Table 1), positively confirming the hot spot area had been located. Initially, the hot spot confirmation sample and four 10-ft radius samples were analyzed (Figure 2). The average of the results (1,107 mg/kg) exceeded the cleanup goal. Therefore, the 20-ft interval samples in the radial direction where each individual sample exceeded the cleanup goal were analyzed and the average concentration of the four outermost samples was compared to the cleanup goal. This process was repeated, analyzing samples radially outward in the directions where lead concentrations were detected above the cleanup goal. Samples were analyzed east and south to a 50-ft radius, but an average below the lead cleanup goal was not achieved to the south. Therefore, the SJCA Tier I Partnering Team agreed to re-mobilize to collect five additional samples in the southern direction in order to delineate the area. No additional samples were necessary in the other directions because the outermost samples in each of those directions had lead concentrations below 400 mg/kg.

During the additional mobilization, surface soil samples were collected at 10-ft intervals from the southern-most sample location, to a total distance of 100 ft from SJS05-SS19. After the 70-ft radius location was averaged in with the other outermost sample results the cleanup goal was achieved, with an average of 295 mg/kg, and no additional samples were analyzed. All sample locations and results are indicated on Figure 2.

SJS05-SS35 Hot Spot

The location of sample SJS05-SS35, which was collected during RI activities in 1999, was identified by an existing sample flag during the February 20, 2007 site visit by the SJCA Tier I Partnering Team and the Biological Technical Assistance Group (BTAG). However, during the sampling event, the existing sample flag was obscured by vegetation and the former sample location was identified using a GPS unit. Four surface soil wall samples were collected around that location radially in each direction at 10-ft intervals to a total distance of 50 ft from the former sample location in order horizontally delineate the extent removal.

Samples were targeted in depositional and/or low topographic areas, when present. When the data was downloaded, a GPS error was identified in which all of the initial sample locations were shifted north by approximately 20 ft, thereby missing the actual location of sample SJS05-SS35. Therefore, although the results met the criteria in the work plan, the samples appear to have missed the previously detected hot spot and the team agreed to collect samples east, south, and west in the initially planned locations. The locations of all of the samples that were collected are shown on Figure 3.

Because cleanup goals were not established to address ecological risk, the results were compared to the maximum 95 percent background upper tolerance limits (UTLs) for surface soil (1,116 micrograms per kilograms [µg/kg] for 4,4'-DDE and 566 µg/kg for 4,4'-DDT) (Table 1). Initially only the 10-ft radius samples were analyzed. The 4,4'-DDT result (1,100 µg/kg) detected in the sample collected west of former sample SJS05-SS35 was the only concentration above the associated background UTL. As a result, the sample collected at the 20-ft interval west of the former sample was analyzed for 4,4'-DDT and the concentration did not exceed the background UTL; therefore, no additional samples were analyzed. Samples in each of the other directions were below the comparison criteria. The sample locations and results are shown on Figure 3.

SJS05-SS66 Hot Spot

The location of sample SJS05-SS66, which was collected and surveyed during Expanded RI activities in 2003, was located using the GPS unit. Four surface soil wall samples were collected around the location radially in each direction at 10-ft intervals to a total distance of 50 ft. Sample locations were targeted in depositional and/or low topographic areas, when present.

Initially only the four 10-ft radius samples were analyzed. The individual copper and average lead concentrations were compared to their risk-based cleanup goals (3,034 mg/kg and 400 mg/kg average, respectively). No concentrations exceeded the risk-based cleanup goals; therefore, no additional samples were analyzed (Table 1). Sample locations and results are indicated on Figure 4.

3.2 Investigative-Derived Waste Management

Excess soil from the sampling activities was replaced into the area from which it was generated. Investigation-derived waste (IDW) generated during the hot spot delineation consisted of solutions used to decontaminate non-disposable sampling equipment. IDW was containerized in an approved 55-gallon drum, stored on secondary containment at the approved IDW staging location located at IR Site 2, and properly labeled. The drums were sampled by CH2M HILL for disposal characterization. Based on the analytical results, non-hazardous waste was identified and disposed of at an approved disposal facility.

4 Conclusions and Recommendations

The surface soil samples have defined the horizontal extent of each hot spot. The results and recommended removal limits for each are described in the following sections.

4.1 SJS05-SS19 Hot Spot

Based on the results presented in Section 3.1, the recommended removal area for the SJS05-SS19 hot spot encompasses approximately 4,320 square feet (ft^2). Figure 2 presents the proposed removal area. The final vertical extent of the removal, assumed to be to 1 ft bgs based on previous investigation results, will be based on confirmation samples.

4.2 SJS05-SS35 Hot Spot

Based on the results presented in Section 3.1, the recommended removal area for the SJS05-SS35 hot spot encompasses approximately 920 ft^2. Figure 3 presents the proposed removal area. The vertical extent of the removal will be 1 ft bgs based on previous investigation results.

4.3 SJS05-SS66 Hot Spot

Based on the results presented in Section 3.1, the recommended removal area for the SJS05-SS66 hot spot encompasses approximately 450 ft^2. Figure 4 presents the proposed removal area. The final vertical extent of the removal, assumed to be to 1 ft bgs based on previous investigation results, will be based on confirmation samples.

5 References

CH2M HILL. 2003a. *Final Remedial Investigation/Human Health Risk Assessment/ Ecological Risk Assessment for Sites 3, 4, 5, and 6*. St. Juliens Creek Annex, Chesapeake, Virginia. March.

CH2M HILL. 2003b. *Final Master Project Plan, St. Juliens Creek Annex, Chesapeake, Virginia*. July.

CH2M HILL. 2006. *Final Expanded Remedial Investigation/Human Health Risk Assessment/ Ecological Risk Assessment for Site 5*. St. Juliens Creek Annex, Chesapeake, Virginia. June.

CH2M HILL. 2007a. *Final Engineering Evaluation/Cost Analysis for Site 5 Waste/Burnt Soil Area and Impacted Surface Soil and Sediment Areas, St. Juliens Creek Annex, Chesapeake, Virginia.* February.

CH2M HILL. 2007b. *Final Work Plan for Delineation of Hot Spot Removal Areas at Site 5, St. Juliens Creek Annex, Chesapeake, Virginia*. May.

NOSSA. 2007. *Explosives Safety Submission (ESS) Determination for Installation Restoration Program Site 5, St. Juliens Creek Annex, Chesapeake, Virginia.* February.

United States Environmental Protection Agency (USEPA). 1993. *Region III Modifications to Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses*. April.

USEPA. 2004. *Region III Modifications to National Functional Guidelines for Organic Data Review Multi-media, Multi-concentration*. September.

Table 1
Surface Soil Detections and Exceedances of Comparison Values
Site 5 Hot Spot Removal Areas Delineation Report
St. Juliens Creek Annex
Chesapeake, Virginia

Hot Spot	Comparison Value	Hot Spot SS19									
Station ID		SJS05-SS19	SJS05-SS19-10E	SJS05-SS19-10N	SJS05-SS19-10S	SJS05-SS19-10W	SJS05-SS19-20E	SJS05-SS19-20N	SJS05-SS19-20S	SJS05-SS19-30E	SJS05-SS19-30S
Sample ID		SJS05-SS19-00-07B*	SJS05-SS19-10E-00-07B	SJS05-SS19-10N-00-07B	SJS05-SS19-10S-00-07B*	SJS05-SS19-10W-00-07B	SJS05-SS19-20E-00-07B	SJS05-SS19-20N-00-07B	SJS05-SS19-20S-00-07B*	SJS05-SS19-30E-00-07B	SJS05-SS19-30S-00-07B
Sample Date		06/19/07	06/19/07	06/19/07	06/19/07	06/19/07	06/19/07	06/19/07	06/19/07	06/19/07	06/19/07
Chemical Name											
Pesticide/Polychlorinated Biphenyls (UG_KG)											
4,4'-DDE	1,116	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT	566	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Metals (MG_KG)											
Copper	3,043	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	400**	1,190 J	1,500 J	1,690 J	1,130 J	26.5 J	1,620	140	887	1,370	2,240

Notes:

* A duplicate sample was collected at this location; the most conservative result is shown.

** Final delineation based on comparison to average lead concentration

Shaded cells represent exceedances of comparison value

NA - Not analyzed

U - Analyte not detected

J - Result may be estimated

L - Reported value may be biased low

Table 1
Surface Soil Detections and Exceedances of Comparison Values
Site 5 Hot Spot Removal Areas Delineation Report
St. Juliens Creek Annex
Chesapeake, Virginia

Hot Spot	Comparison Value	Hot Spot SS19						Hot Spot SS35			
Station ID		SJS05-SS19-40E	SJS05-SS19-40S	SJS05-SS19-50E	SJS05-SS19-50S	SJS05-SS19-60S	SJS05-SS19-70S	SJS05-SS35-10EA	SJS05-SS35-10EB	SJS05-SS35-10N	SJS05-SS35-10SA
Sample ID		SJS05-SS19-40E-00-07B	SJS05-SS19-40S-00-07B	SJS05-SS19-50E-00-07B	SJS05-SS19-50S-00-07B	SJS05-SS19-60S-00-07C*	SJS05-SS19-70S-00-07C	SJS05-SS35-10E-00-07B*	SJS05-SS35-10E-00-07C*	SJS05-SS35-10N-00-07B	SJS05-SS35-10S-00-07B
Sample Date		06/19/07	06/19/07	06/19/07	06/19/07	08/09/07	08/09/07	06/20/07	08/09/07	06/20/07	06/20/07
Chemical Name											
Pesticide/Polychlorinated Biphenyls (UG_KG)											
4,4'-DDE	1,116	NA	NA	NA	NA	NA	NA	270 J	220	140	140
4,4'-DDT	566	NA	NA	NA	NA	NA	NA	330 J	270	170	58
Total Metals (MG_KG)											
Copper	3,043	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	400**	841	1,700	257	1,570	1,850	756	NA	NA	NA	NA

Notes:

* A duplicate sample was collected at this location; the most conservative result is shown.

** Final delineation based on comparison to average lead concentration

Shaded cells represent exceedances of comparison value

NA - Not analyzed

U - Analyte not detected

J - Result may be estimated

L - Reported value may be biased low

Table 1
Surface Soil Detections and Exceedances of Comparison Values
Site 5 Hot Spot Removal Areas Delineation Report
St. Juliens Creek Annex
Chesapeake, Virginia

Hot Spot	Comparison Value	Hot Spot SS35				Hot Spot SS66			
Station ID		SJS05-SS35-10SB	SJS05-SS35-10WA	SJS05-SS35-10WB	SJS05-SS35-20WA	SJS05-SS66-10E	SJS05-SS66-10N	SJS05-SS66-10S	SJS05-SS66-10W
Sample ID		SJS05-SS35-10S-00-07C	SJS05-SS35-10W-00-07B	SJS05-SS35-10W-00-07C*	SJS05-SS35-20W-00-07B	SJS05-SS66-10E-00-07B	SJS05-SS66-10N-00-07B*	SJS05-SS66-10S-00-07B	SJS05-SS66-10W-00-07B
Sample Date		08/09/07	06/20/07	08/09/07	06/20/07	06/20/07	06/19/07	06/20/07	06/19/07
Chemical Name									
Pesticide/Polychlorinated Biphenyls (UG_KG)									
4,4'-DDE	1,116	460 J	740	30	510	NA	NA	NA	NA
4,4'-DDT	566	520 J	1,100	16	290	NA	NA	NA	NA
Total Metals (MG_KG)									
Copper	3,043	NA	NA	NA	NA	41.2	41.5 L	41.3	29 L
Lead	400**	NA	NA	NA	NA	67.8	78.8 J	42.3	40.8 J

Notes:

* A duplicate sample was collected at this location; the most conservative result is shown.

** Final delineation based on comparison to average lead concentration

Shaded cells represent exceedances of comparison value

NA - Not analyzed

U - Analyte not detected

J - Result may be estimated

L - Reported value may be biased low

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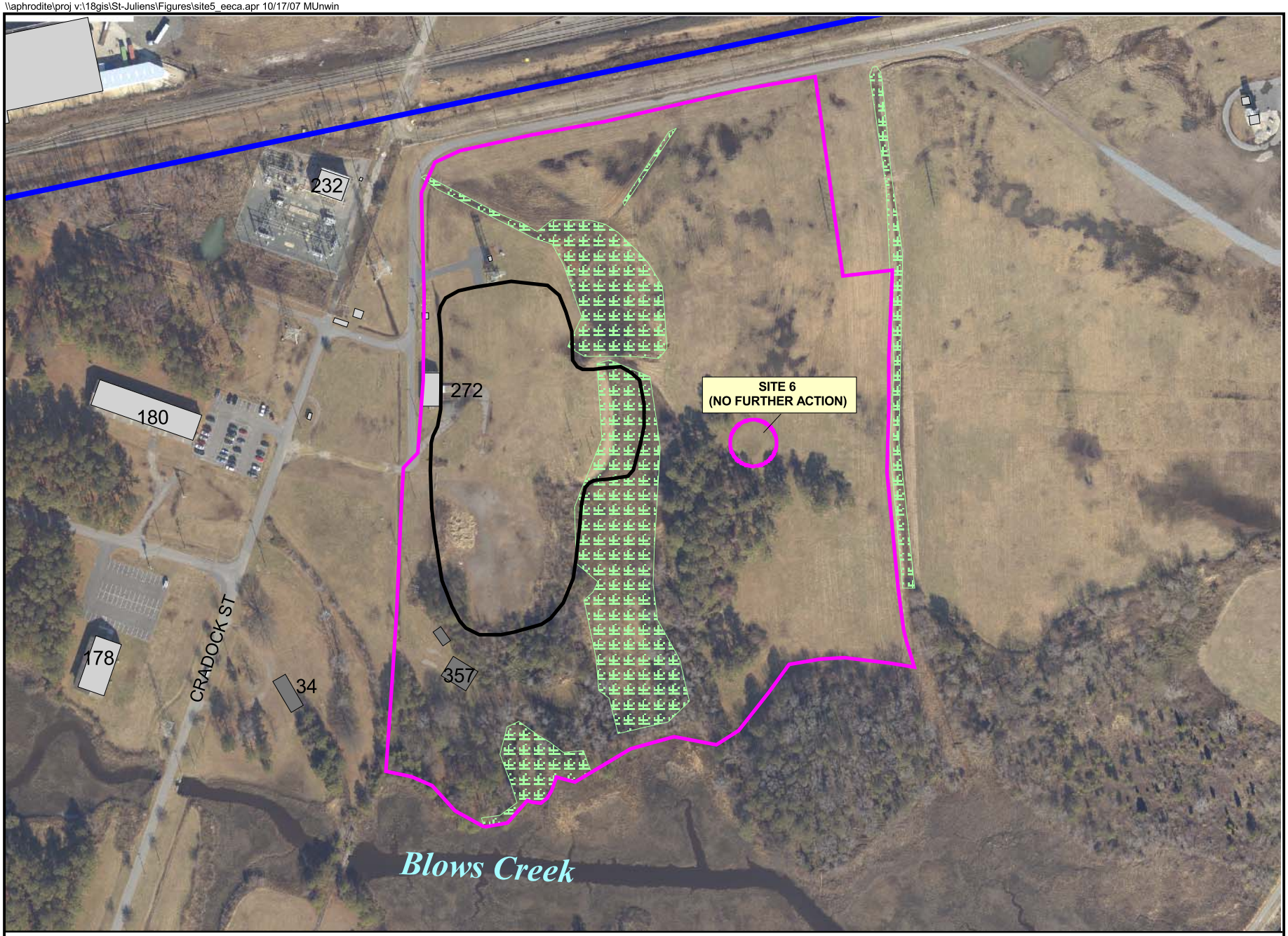

LEGEND

- Activity Boundary
- Site 5 Boundary
- Site 5 Waste/Burnt Soil Area
- Existing Delineated Wetland Area
- Existing Buildings
- Former Buildings

N

0 125 250 Feet

Figure 1
Site 5 Vicinity
Site 5 Hot Spot Removal Areas Delineation Report
St. Juliens Creek Annex
Chesapeake, Virginia

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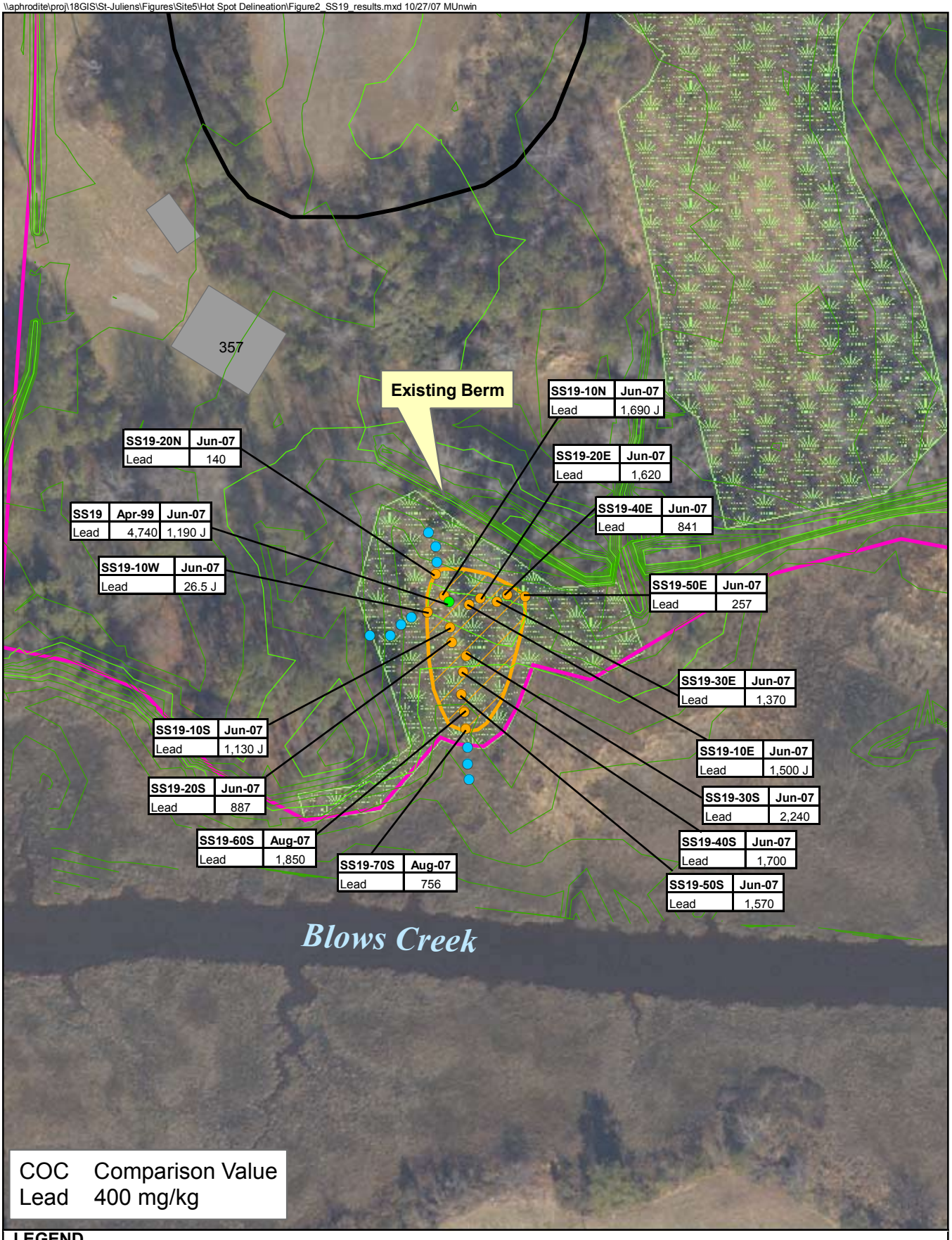

LEGEND

- Site 5 Boundary
- Site 5 Waste/Burnt Soil Area
- Extent of Hot Spot SS19 Removal (volume = 160 cubic yards) (area = 4,324 square feet)
- Existing Delineated Wetland Area
- Former Buildings
- Hot Spot
- Analyzed Sample Locations
- Collected Sample Locations

All values reported in mg/kg
J = Reported value is estimated

N

0 40 80 Feet

Figure 2
Hot Spot SS19
Site 5 Hot Spot Removal Areas
Delineation Report
St. Juliens Creek Annex
Chesapeake, Virginia

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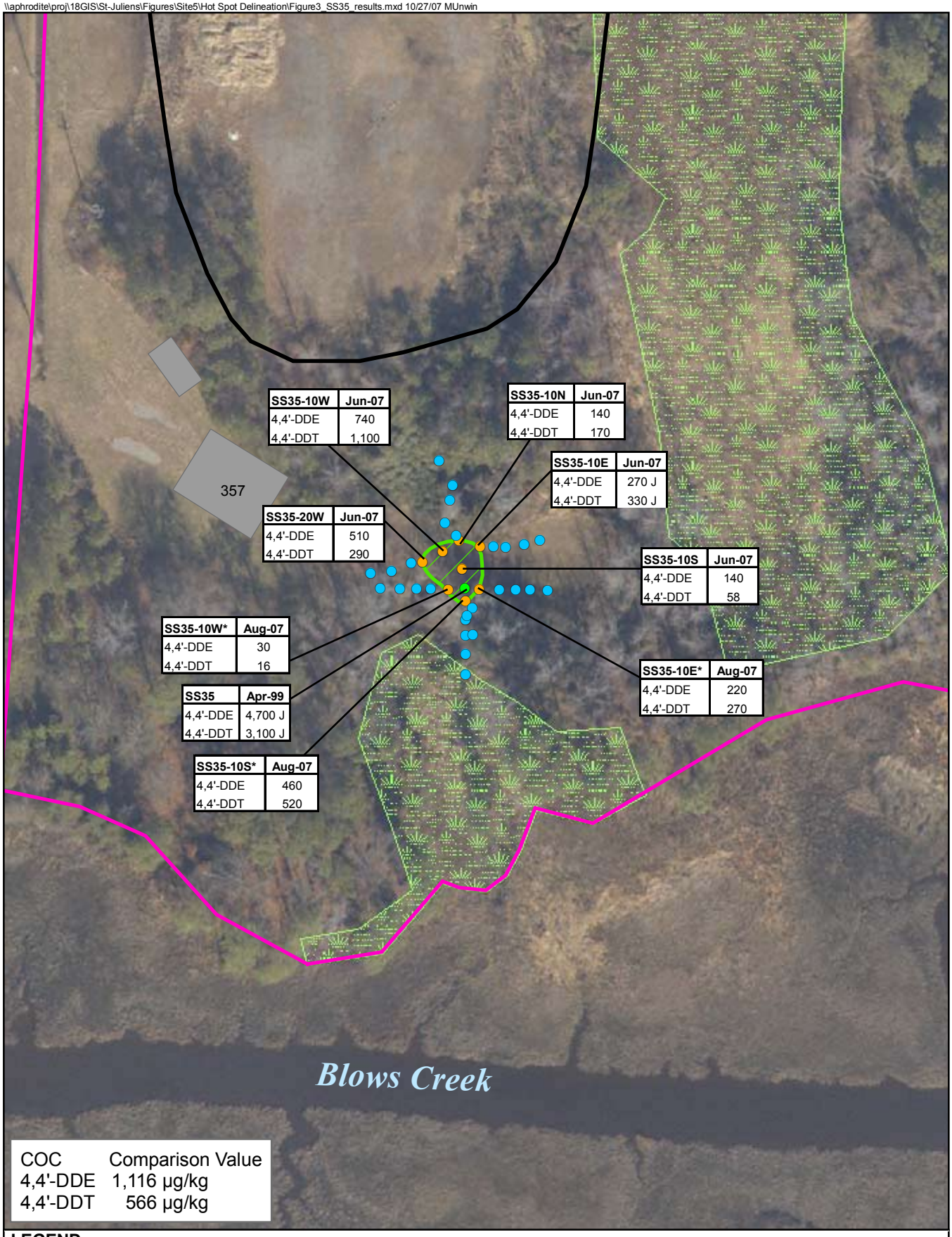

LEGEND

- Site 5 Boundary
- Site 5 Waste/Burnt Soil Area
- Extent of Hot Spot SS35 Removal (volume = 34 cubic yards) (area = 930 square feet)
- Existing Delineated Wetland Area
- Former Buildings
- Hot Spot
- Analyzed Sample Locations
- Collected Sample Locations

All values reported in µg/kg
*samples collected during second mobilization
J = Reported value is estimated

N

0 40 80 Feet

Figure 3
Hot Spot SS35
Site 5 Hot Spot Removal Areas
Delineation Report
St. Juliens Creek Annex
Chesapeake, Virginia

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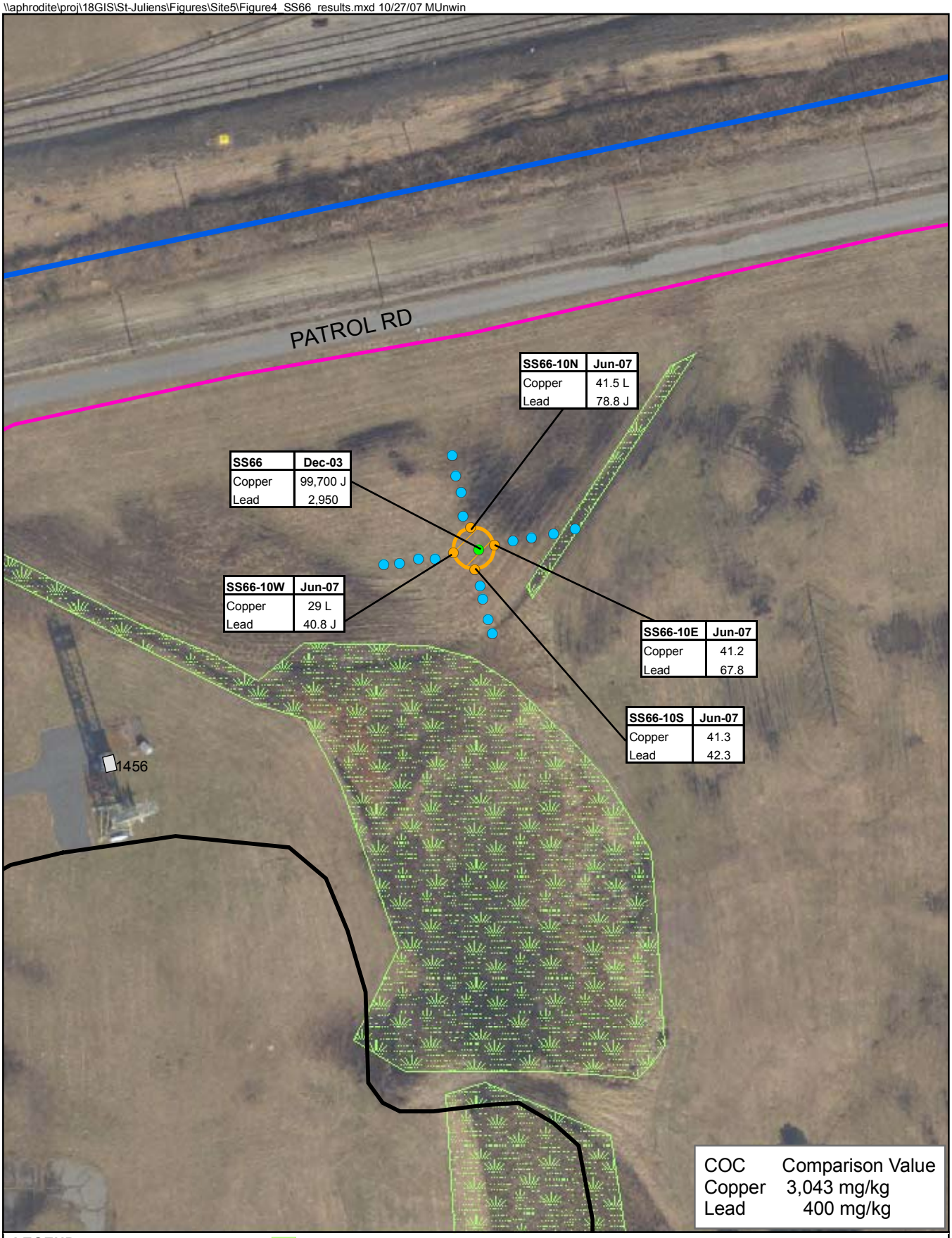

LEGEND

- Activity Boundary
- Site 5 Boundary
- Site 5 Waste/Burnt Soil Area
- Extent of Hot Spot SS66 Removal (volume = 17 cubic yards) (area = 453 square feet)
- Existing Delineated Wetland Area
- Existing Building
- Hot Spot
- Analyzed Sample Location
- Collected Sample Location

All values reported in mg/kg
J = Reported value is estimated
L = Reported value is biased low

N

0 40 80 Feet

Figure 4
Hot Spot SS66
Site 5 Hot Spot Removal Areas
Delineation Report
St. Juliens Creek Annex
Chesapeake, Virginia

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Attachment A
Analytical Results

Table A-1
Surface Soil Analytical Results
Site 5 Hot Spot Removal Areas Delineation Report
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	SJS05-SS19		SJS05-SS19-10E	SJS05-SS19-10N	SJS05-SS19-10S		SJS05-SS19-10W	SJS05-SS19-20E	SJS05-SS19-20N	SJS05-SS19-20S		SJS05-SS19-30E	SJS05-SS19-30S
Sample ID	SJS05-SS19-00-07B	SJS05-SS19-00-07BP*	SJS05-SS19-10E-00-07B	SJS05-SS19-10N-00-07B	SJS05-SS19-10S-00-07B	SJS05-SS19-10S-00-07BP*	SJS05-SS19-10W-00-07B	SJS05-SS19-20E-00-07B	SJS05-SS19-20N-00-07B	SJS05-SS19-20S-00-07B	SJS05-SS19-20S-00-07BP*	SJS05-SS19-30E-00-07B	SJS05-SS19-30S-00-07B
Sample Date	06/19/07	06/19/07	06/19/07	06/19/07	06/19/07	06/19/07	06/19/07	06/19/07	06/19/07	06/19/07	06/19/07	06/19/07	06/19/07
Chemical Name													
Pesticide/Polychlorinated Biphenyls (UG_KG)													
4,4'-DDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Metals (MG_KG)													
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	1,100 J	1,190 J	1,500 J	1,690 J	1,130 J	1,100 J	26.5 J	1,620	140	887	727 J	1,370	2,240

Notes:
* Duplicate sample
NA - Not analyzed
U - Analyte not detected
J - Result may be estimated
L - Reported value may be biased low

Table A-1
Surface Soil Analytical Results
Site 5 Hot Spot Removal Areas Delineation Report
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	SJS05-SS19-40E	SJS05-SS19-40S	SJS05-SS19-50E	SJS05-SS19-50S	SJS05-SS19-60S		SJS05-SS19-70S	SJS05-SS35-10EA		SJS05-SS35-10EB		SJS05-SS35-10N	SJS05-SS35-10SA
Sample ID	SJS05-SS19-40E-00-07B	SJS05-SS19-40S-00-07B	SJS05-SS19-50E-00-07B	SJS05-SS19-50S-00-07B	SJS05-SS19-60S-00-07C	SJS05-SS19-60S-00-07CP*	SJS05-SS19-70S-00-07C	SJS05-SS35-10E-00-07B	SJS05-SS35-10E-00-07BP*	SJS05-SS35-10E-00-07C	SJS05-SS35-10E-00-07CP*	SJS05-SS35-10N-00-07B	SJS05-SS35-10S-00-07E
Sample Date	06/19/07	06/19/07	06/19/07	06/19/07	08/09/07	08/09/07	08/09/07	06/20/07	06/20/07	08/09/07	08/09/07	06/20/07	06/20/07
Chemical Name													
Pesticide/Polychlorinated Biphenyls (UG_KG)													
4,4'-DDE	NA	NA	NA	NA	NA	NA	NA	270 J	86 J	220	140	140	140
4,4'-DDT	NA	NA	NA	NA	NA	NA	NA	330 J	120 J	270	180	170	58
Total Metals (MG_KG)													
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	841	1,700	257	1,570	1,300	1,850	756	NA	NA	NA	NA	NA	NA

Notes:
* Duplicate sample
NA - Not analyzed
U - Analyte not detected
J - Result may be estimated
L - Reported value may be biased low

Table A-1
Surface Soil Analytical Results
Site 5 Hot Spot Removal Areas Delineation Report
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	SJS05-SS35-10SB	SJS05-SS35-10WA	SJS05-SS35-10WB		SJS05-SS35-20WA	SJS05-SS66-10E	SJS05-SS66-10N		SJS05-SS66-10S	SJS05-SS66-10W
Sample ID	SJS05-SS35-10S-00-07C	SJS05-SS35-10W-00-07B	SJS05-SS35-10W-00-07C	SJS05-SS35-10W-00-07CP*	SJS05-SS35-20W-00-07B	SJS05-SS66-10E-00-07B	SJS05-SS66-10N-00-07B	SJS05-SS66-10N-00-07BP*	SJS05-SS66-10S-00-07B	SJS05-SS66-10W-00-07B
Sample Date	08/09/07	06/20/07	08/09/07	08/09/07	06/20/07	06/20/07	06/19/07	06/19/07	06/20/07	06/19/07
Chemical Name										
Pesticide/Polychlorinated Biphenyls (UG_KG)										
4,4'-DDE	460 J	740	25	30	510	NA	NA	NA	NA	NA
4,4'-DDT	520 J	1,100	16	13	290	NA	NA	NA	NA	NA
Total Metals (MG_KG)										
Copper	NA	NA	NA	NA	NA	41.2	41.5 L	38.4 L	41.3	29 L
Lead	NA	NA	NA	NA	NA	67.8	72.3 J	78.8 J	42.3	40.8 J

Notes:
* Duplicate sample
NA - Not analyzed
U - Analyte not detected
J - Result may be estimated
L - Reported value may be biased low

Table A-2
QA/QC Analytical Results
Site 5 Hot Spot Removal Areas Delineation Report
St. Juliens Creek Annex
Chesapeake, Virginia

Station ID	STJ-QC				
Sample ID	SJS05-EB061907[1]	SJS05-EB062007[1]	SJS05-FB062007[2]	SJS05-EB080907[1]	SJS05-FB080907[2]
Sample Date	06/19/07	06/20/07	06/20/07	08/09/07	08/09/07
Chemical Name					
Pesticide/Polychlorinated Biphenyls (UG_L)					
4,4'-DDE	NA	0.1 U	0.1 U	0.11 U	0.11 U
4,4'-DDT	NA	0.1 U	0.1 U	0.11 U	0.11 U
Total Metals (UG_L)					
Copper	2.8 L	6.4 J	2.6 J	NA	NA
Lead	10 U	2 K	10 U	10 UL	10 UL

Notes:
[1]Equipment Blank
[2] Field Blank
NA - Not analyzed
U - Analyte not detected
J - Result may be estimated
K - Reported value may be biased high
L - Reported value may be biased low
UL - Analyte not detected, quantitation limit is probably higher

Attachment B
Data Validation Summary Report

CH2M HILL-WDC
15010 Conference Center Drive, Suite 200
Chantilly, VA 20151

September 26, 2007
SDG# 708075, GPL Laboratories
St. Julien's Creek Annex, Site 5

Dear Ms. Davenport,

The following Data Validation report is provided as requested for the parameters noted in the table below for SDG #708075. The data validation was performed in accordance with the quality control requirements of the USEPA CLP Statements of Work OLM04.3 for select Pesticides and the USEPA CLP Statement of Work ILM05.3 for select metals. Also used in the validation of these samples were the Region III Modifications to the National Functional Guidelines for Organic Data Review, 9/94, and to the Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Data Review, 4/93, (as referred by the Region III document Innovative Approaches to Data Validation, 6/95, for Level M3/IM-2 review).

Sample ID	Lab ID	Matrix	Select Pesticides	Pb
SJS05-FB080907	708075-024	water	X	X
SJS05-EB080907	708075-025	water	X	X
SJS05-SS35-10E-00-07C	708075-007	soil	X	
SJS05-SS35-10E-00-07CP	708075-008	soil	X	
SJS05-SS35-10S-00-07C	708075-019	soil	X	
SJS05-SS35-10S-00-07CMS	708075-019MS	soil	X	
SJS05-SS35-10S-00-07CMSD	708075-019MSD	soil	X	
SJS05-SS35-10W-00-07C	708075-013	soil	X	
SJS05-SS35-10W-00-07CP	708075-014	soil	X	
SJS05-SS19-60S-00-07C	708075-001	soil		X
SJS05-SS19-60S-00-07CMS	708075-001MS	soil		X
SJS05-SS19-60S-00-07CMD	708075-001MD	soil		X
SJS05-SS19-70S-00-07C	708075-002	soil		X
SJS05-SS19-70S-00-07CMS	708075-002MS	soil		X
SJS05-SS19-70S-00-07CMD	708075-002MD	soil		X
SJS05-SS19-60S-00-07CP	708075-003	soil		X

All areas of concern are discussed in the body of the report and a summary of data qualification is provided. The samples were evaluated based on the following criteria:

- Data Completeness *
- Technical Holding Times *

- GC Performance *
- Initial/Continuing Calibrations *
- CRI Standards
- Interference Check Sample *
- Blanks *
- Surrogate Recoveries
- Laboratory Control Samples *
- Matrix Spike Recoveries *
- Matrix Duplicate RPDs *
- Post Digestion Spike Recoveries *
- Serial Dilutions *
- Field Duplicates *
- Identification/Quantitation
- Reporting Limits *

*- indicates that no qualifications were required based on this criteria

The following quality control samples were used to validate this sample delivery group (SDG): sample SJS05-EB080907-rinse blank; sample SJS05-FB080907-field blank; sample SJS05-SS35-10E-00-07BP-field duplicate of sample SJS05-SS35-10E-00-07B; sample SJS05-SS35-10W-00-07BP-field duplicate of sample SJS05-SS35-10W-00-07B; and sample SJS05-SS19-60S-00-07BP-field duplicate of sample SJS05-SS19-60S-00-07B

Overall Evaluation of Data/Potential Usability Issues

Specific details regarding qualification of the data are addressed in the Specific Evaluation section of this narrative. If an issue is not addressed there were no actions required based on unmet quality criteria.

Major Problems

There were no major problems noted in this SDG. None of the data required rejected.

Minor Problems

Issues requiring qualification of the analytical data were found in the validation of this SDG. A summary of these issues for each fraction is presented in the following paragraphs. All results qualified as estimated J/UJ, biased high K, or biased low L/UL, should be considered usable but estimated. In cases where more than one qualifier was applied due to multiple quality control issues the validator has chosen one qualifier/qualifier code for the purpose of simplifying the electronic deliverable. However, the body of the report and the summary table at the end of the report indicate all applicable qualifiers.

Select Pesticides

One sample exhibited non-compliant surrogate recoveries for which qualifications were required.

Dilutions were required to accurately quantitate the target compound results. The E flagged results were rejected in favor of the results reported in the dilution analyses.

Select Metals

The CRDL standards associated with the field QC blank samples exhibited non-compliant %Rs for the analyte lead. Qualification as biased high K was required in one sample.

Specific Evaluation of Data

Data Completeness

This data package was complete. No resubmissions were required.

Technical Holding Times

According to chain of custody records, sampling was performed on 8/9/07 and samples were received at the laboratory 8/10/17. All sample preparation and analysis was performed within Region III holding time requirements.

CRDL Standards

Select Metals

CRDL standards exhibited non-compliant recoveries above or below the Region III QC limit of 90% - 110% for several analytes. Region III QC limits were used to flag the samples. A summary of non-compliance and affected samples are noted in the following table.

Std ID	Analyte	%R	Samples	Q Flag	Q code
CRI	lead	85%	SJS05-EB080907, SJS05-FB080907	UL	OT

Surrogate Recoveries

Select Pesticides

One sample exhibited non-compliant surrogate recoveries for which qualifications were required. Specific action is noted in the following table.

Sample ID	Surrogate Compound	%R	Q Flag	Q code
SJS05-SS35-10S-00-07CDL	DCB	229, 177	J+	SSH

Compound Identification/Quantitation

Select Pesticides

The pesticide soil samples SJS05-SS35-10E-00-07C, SJS05-SS35-10E-00-07CP, and SJS05-SS35-10S-00-07C required dilution to accurately quantitate the target compounds. The E flagged results were rejected in these samples in favor of the results reported from the dilution analysis. Results in the dilution analyses that were not used were rejected in favor of the results reported from the undiluted analyses. Q Code: DL

A summary of qualifications required is provided on the following page. Please do not hesitate to contact DataQual ES with any questions regarding this validation report.

Sincerely,

Jacqueline Cleveland
Vice-President

Summary of Data Qualifications

Select Pesticides

Sample ID	Compound	Results	Q Flag	Q code
SJS05-SS35-10S-00-07CDL	all compounds	+	J	SSH
SJS05-SS35-10E-00-07C, SJS05-SS35-10E-00-07CP, SJS05-SS35-10S-00-07C	all compounds	+E	R	DL

Select Metals

Sample ID	Analyte	Results	Q Flag	Q code
SJS05-EB080907, SJS05-FB080907	lead	-	UL	OT

Glossary of Qualification Flags and Abbreviations

Qualification Flags (Q-Flags)

U	not detected above the reported sample quantitation limit
J	estimated value
UJ	reported quantitation limit is qualified as estimated
R	result is rejected; the presence or absence of the analyte cannot be verified
D	result value is based on dilution analysis result
NJ	analyte has been tentatively identified, estimated value
L	analyte present, biased low
UL	not detected, quantitation limit is probably higher
K	analyte present, biased high
Q	estimated dioxin/furan concentration
I	interferences present which may cause the results to be biased high

Method Blank Qualification Flags (Q-Flags)

NA	The sample result for the blank contaminant is greater than the sample RL and is greater than 5X the blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.
B	The sample result for the blank contaminant is less than or greater than the sample RL and is less than 5X the blank value. The sample result for the blank contaminant is qualified as B at the compound value reported.

General Abbreviations

IDL	Instrument Detection Limit
MDL	Method Detection Limit
CRDL	Contract Required Detection Limit
CRQL	Contract Required Quantitation Limit
+	positive result
-	non-detect result